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## ABSTRACTS

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The Editor recognizes the inevitable incompleteness and arbitrary selectivity of any abstracting service, including this one. It is his belief that the usefulness of the present Abstracts section will be enhanced if the reader is informed of the general purpose of the abstracts and the criteria employed in their selection.

It is the purpose of the Abstracts section to acquaint the diversified and international readership of the REVIEW with the gist of original and scientific articles which are related to the general subjects of tuberculosis or pulmonary diseases implicit in the title of the journal. In this connection, 37 abstracters systematically review 207 journals which represent 31 countries and which are published in 18 languages. In most instances, abstracters cover journals in fields of their special competence. It is evident that the diverse interests of the readers of the REVIEW dictate a balanced selection of clinical, laboratory, and epidemiologic studies. Such selection will often preclude the publication of articles equal in scientific merit to many presented here.

In the publication of abstracts, cognizance is taken of the extent to which the journals yielding them are circulated. Articles from journals of wide circulation may be mentioned by title only. This space-saving device is also employed for articles which defy condensation without the omission of essential data or discussion. The attention of readers is thus directed to the existence of papers which are no less important because they are not summarized.

## CLINICAL STUDIES

### PULMONARY—THORACIC

**The Mechanics of Breathing in Different Body Positions: I. In Normal Subjects.** E. O. ATTINGER, R. G. MONROE, and M. S. SEGAL. *J. Clin. Investigation*, August, 1956, 8: 904–911.

The mechanics of breathing were studied in 8 normal subjects. Intrapleural and intra-esophageal pressures were compared in 4 patients in different body positions. Intrapleural pressure differences were usually somewhat greater than intra-esophageal pressures. End expiratory intra-esophageal pressure is usually more positive than end expiratory intrapleural pressure. The difference varies from subject to subject and in each subject depending upon the body position. Intra-esophageal pressures seem to be adequate for the measurement of the mechanics of breathing, but unsuitable for the determination of absolute lung distention (midposition). Compliance and mechanical resistance were measured during slow and rapid breathing in the supine, sitting, and prone positions. Compliance was lowest in the supine and highest in the sitting position and did not change with change in respiratory rate. Mechanical resistance was usually highest in the supine and lowest in the sitting position, expiratory resistance being somewhat higher than inspiratory resistance in all positions studied. The full significance of pulmonary function testing can only be determined after considering the body position during the tests.

E. DUNNER

**The Mechanics of Breathing in Different Body Positions: II. In Cardiopulmonary Disease.** E. O. ATTINGER, J. A. HERSCHFUS, and M. S. SEGAL. *J. Clin. Investigation*, August, 1956, 8: 912–919.

Studies in the mechanics of breathing in a group of patients with chronic pulmonary emphysema and a group of patients with various cardiopulmonary diseases are reported. Compliance and mechanical resistance were measured during slow and fast respiratory rates

in the supine, sitting, prone, head down, and lateral positions. Both patient groups showed lower mean compliance and considerably higher mean mechanical resistance than the normal group. Expiratory resistance was considerably higher than inspiratory resistance in both patient groups. The positional changes were in the same direction as noted in the normal group. Compliance was lowest in the supine and highest in the sitting position and mechanical resistance was highest in the supine and lowest in the sitting position. The prone position compared favorably with the sitting position while the head down and lateral were nearer the supine position. Patients with predominantly unilateral disease showed in general a lower compliance and higher resistance when lying on the diseased side as compared with lying on the healthy side. In both patient groups there was a marked drop of compliance with increase in the respiratory rate in all positions studied. The drop in compliance was smallest in the sitting position.

E. DUNNER

**A Study of the Onset of Respiration in the Newborn.** J. S. FRASER. *Arch. Dis. Childhood*, December, 1955, 30: 546–547.

The onset of respiration was observed in 190 cases comprising four series, namely, spontaneous, forceps, Caesarean, and breech deliveries.

The gasp, or lower medullary type, most frequently initiated respiration in all groups. In no case did the onset occur with normal respiration, indicating that some degree of anoxemia was present in all cases. The periods of apnea before the onset of respiration were noted. The longer periods of apnea occurred mainly following abnormal types of delivery, probably due to superadded cerebral edema and hemorrhage (Author's summary).

G. BONDI

**The Arterial Distribution to the Left Upper Pulmonary Lobe.** R. J. BARRETT, J. C. DAY, and WM. M. TUTTLE. *J. Thoracic Surg.*, August, 1956, 32: 190–197.

Errors in the description of the arterial supply of the left upper lobe have been perpetuated in the literature, particularly concerning the erroneous conception that the first branch of the left pulmonary artery is an apicoposterior vessel rather than an anterior or apicoanterior trunk. The concept that the lingular artery is very frequently the source of part of the arterial supply of the anterior segment is also considered unrealistic.

In one-sixth of the cases reported the lingular artery supplied segments other than lingula. In only 8 per cent of the cases will the anterior segment receive even part of its supply from the lingular vessels. In 4 per cent the lingular artery sends a branch to one of the basilar segments of the lower lobe.

Whereas it has been stated that the first branch of the left pulmonary artery is most frequently an apicoposterior trunk, in the study of 100 cases this occurred in only 10 per cent. Conversely, the first branch has been found to be an anterior or apicoanterior artery in fully 80 per cent of the cases. A considerably larger unrecorded experience has shown no major divergence from these findings.

R. E. MACQUIGG

**The Hyaline Membrane Syndrome in Premature Infants.** W. BLYSTAD. *Arch. Dis. Childhood*, February, 1956, 31: 33–34.

The study is based on clinical and post-mortem findings in 47 premature infants who died within five days after birth. According to the predominant clinical feature, the cases were divided into two groups. The 25 patients in *Group 1* showed dyspnea setting in a few hours after birth. The second group of 22 patients was characterized by depression of respiration.

In *Group 1*, severe pulmonary changes were found in all cases. They consisted of atelectasis, hyaline membrane, pneumonia, and hemorrhage, in various combinations. Intracranial hemorrhage was found in 7 cases, and was moderate in 4 of them.

In *Group 2*, intracranial hemorrhage was found in 11 cases. It was often more extensive than in *Group 1*. In 7 cases, hyaline membrane and atelectasis were seen. It is noteworthy that these changes may be present in cases in which no dyspnea had been observed. Significant pulmonary changes in the form of atelectasis, pneumonia, or hemorrhage were also seen in many of the other patients of the second group.

The depressed respiration seen in the patients of *Group 2* seemed to indicate a damaged central nervous system. However, the absence of dyspnea does not exclude the possibility

that the pulmonary changes were the primary cause of the asphyxia in some of the infants of the second group also. The poorly functioning lungs could have led to anoxic depression of the respiratory center, which could then no longer respond adequately to the respiratory situation.

The author believes that in many premature infants pulmonary pathologic changes constitute the main cause of asphyxia even where no early neonatal dyspnea has been observed.

G. BONDI

**Present-Day Management of Pleural Empyema in Infants and Adults.** G. E. LINDSKOG. *New England J. Med.*, August 16, 1956, 255: 320–325.

During the past fifteen years there has been a dramatic decline in the incidence of empyema. This decrease is related to the early treatment of pneumonia with antimicrobials, frequently outside of hospitals and often without bacteriologic controls.

In a four-year period ending July, 1943, there were 493 admissions to the thoracic surgical section of the New Haven Hospital; of these 82, or 16.7 per cent, represented problems in acute or chronic empyema. In a more recent four-year period ending July, 1955, there were 1,262 admissions to the same thoracic service, but only 30, or 2.4 per cent, had the diagnosis of empyema. There has been a relative increase in the incidence of staphylococcal infections of the pleura.

Thin, seropurulent exudates such as are typically caused by streptococcal or early pneumococcal infection should be managed by thoracentesis. Every attempt should be made to identify the responsible organism by smears and cultures. Well-established, thick, purulent exudates, especially when roentgenographically loculated, should be given a trial of enzymatic debridement with the use of streptokinase-streptodornase or trypsin. In cases with inaccessible loculations, markedly thickened pleura, foreign bodies, and open fistula, early intercostal thoracotomy and decortication should be carried out.

It is now generally accepted that the appropriate treatment of chronic empyema complicating an irreversible parenchymal lesion of the lung is a single-stage excision of the empyema pocket, usually by extrapleural dissection with simultaneous removal of the pulmonary disease by segmental resection, lobectomy, or pneumonectomy as the situation demands. Delays in diagnosis and treatment, improper use of antimicrobials, imperfect drainage, fistulas and, rarely, foreign bodies contribute to chronicity.

In conclusion, some mention must be made of the important role of physiotherapeutic measures in recovery from chronic empyema and in control of the scoliotic deformities that are a particular threat in the child and adolescent.

M. J. SMALL

**Pathogenesis of Eosinophilic Pneumonitis (Löffler's Syndrome).** W. L. EPSTEIN and A. M. KLIGMAN. *J.A.M.A.*, September 8, 1956, 162: 95–97.

Seven patients who had received two to six injections of 3-pentadecylcatechol in sesame oil for prophylaxis against poison ivy dermatitis developed cough, dyspnea, malaise, and fever within eight to forty-eight hours after the last injection. The chest roentgenograms showed varied degrees of patchy infiltrations. The only significant laboratory finding was leukocytosis with eosinophilia. The diagnosis was eosinophilic pneumonia. The pulmonary phenomena are explained by a mechanism which traps eosinophils in the lung, and not by an allergic reaction.

H. ABELES

**Etiology and Mechanism of Harrison's Grooves.** H. A. BRODKIN. *J.A.M.A.*, August 18, 1956, 161: 1355–1359.

The three anterior chest wall deformities, funnel chest, pigeon breast, and Harrison's grooves, are due to unbalanced diaphragmatic contractions produced during infancy by a congenital, abnormal development of the anterior segment of the diaphragm. Weakness or underdevelopment of a portion or of the whole of the anterior segment of the diaphragm will result in an unbalancing of the contraction forces and a retraction of the diaphragm's attachment to the anterior chest wall by the stronger posterior and lateral segments. Specifically, in the case of Harrison's grooves, the pull is on that portion of the anterior segment that is attached to the sixth costal cartilage. Severe dyspnea requiring stronger, deeper diaphragmatic contractions may also produce

similar unbalanced diaphragmatic contractions; if this occurs when the anterior chest wall is still soft, deformities may be produced. A case report illustrates the correction of a severe, unilateral Harrison's groove in a twenty-month-old baby by freeing the sixth and seventh costal cartilages from their diaphragmatic attachment and suturing them in their new relaxed positions.

H. ABELES

**Congenital Atresia of the Esophagus in Brothers.** H. SLOAN and C. HAIGHT. *J. Thoracic Surg.*, August, 1956, 32: 209–215.

Esophageal atresia with tracheo-esophageal fistula was encountered in 2 brothers born successively, and was repaired successfully in both. Since the presence of atresia in siblings has been verified only six times and suspected in two other instances, the probability of its occurrence more than once in a family seems remote. The presumed incidence of esophageal atresia is one in 3,100 births.

R. E. MACQUIGG

**Pulmonary Congestion and Edema in Uremia.** S. W. DE PASS, J. STEIN, M. POPPEL, and H. G. JACOBSON. *J.A.M.A.*, September 1, 1956, 162: 5–9.

Roentgenograms of the chest in cases of so-called pulmonary azotemia show bilaterally symmetrical densities in the central lung fields with comparatively clear peripheral zones. These findings have been assumed to be characteristic of the lung in uremia and to be absent when pulmonary congestion and edema arise from other causes. On the basis of six detailed case reports it is believed that the term pulmonary azotemia should be abandoned because the pulmonary findings represent, primarily, pulmonary congestion and edema. These roentgenographic findings can be produced by primary cardiac decompensation without renal disease.

H. ABELES

**Syndromes Associated with "Allergic" Vasculitis.** R. P. MCCOMBS, J. F. PATTERSON, and H. E. MACMAHON. *New England J. Med.*, August 9, 1956, 255: 251–258.

Vasculitis of varying degrees of severity is commonly encountered in conditions known to be due to hypersensitivity. It is also a common denominator in several conditions of uncertain etiology, but in which there are strong suggestions that hypersensitivity may be an important factor. It is suggested that the term "allergic" vasculitis be used to designate this disorder.

In a series of 30 living patients with "allergic" vasculitis who did not have systemic lupus erythematosus or periarteritis nodosa, 18 could be classified as having one of five clinical syndromes: contact dermatitis, with generalized sensitization or "id" reaction; urticaria, with angioneurotic edema; vascular purpura; erythema nodosum; or dermatomyositis. The remaining 12 cases could not be classified in any recognizable syndrome.

Two patients had pneumonitis or nodular changes in the lung parenchyma due to sarcoidosis; 2 others had pleural effusions as a phase of the illness. Two patients had diffuse pneumonitis; it is assumed that this may have been associated with vasculitis of the lung. This phase of "allergic" vasculitis may be associated with glomerulitis and renal failure, and in these cases the prognosis is poor. Other manifestations included arthralgias, edema, purpura, fever, weight loss, subcutaneous nodules, dermatitis, muscle tenderness and weakness, urticaria, neuritis, gastrointestinal bleeding, and renal failure.

Drugs, antibiotics, infective agents, and malignant tumors at times function as antigens. Vascular damage probably results from a reaction of antigen and antibody fixed in the vessel wall. Removal of the antigen, if possible, leads to cure. Cortisone and other adrenal steroids have an almost specific effect on the vascular lesions and promote healing and sclerosis. The prognosis for recovery is good in all cases except those with renal failure.

M. J. SMALL

**Pulmonary Tuberculosis Under Long-Term Treatment with Corticotrophin and Chemotherapy: A Report on Three Cases.** H. CLIMIE, G. BEVEN, and S. R. SIMS. *Brit. J. Tuberc.*, July, 1956, 50: 265–268.

Three patients with pulmonary tuberculosis who received long-term treatment with corticotropin and chemotherapy are described. Clinical and roentgenographic improvement occurred when corticotropin was added to the treatment of patients previously deteriorating on streptomycin and PAS or isoniazid. One

case demonstrated that a minimal dose of corticotropin is required to suppress completely the signs of hypersensitivity to PAS; when the dose is too low, fever and rash develop. Long-term treatment up to one year is possible.

Treatment with corticotropin can be used with safety for rheumatoid arthritis and psoriasis complicated by pulmonary tuberculosis, provided that adequate chemotherapy is given.

M. J. SMALL

**Tuberculosis and Syphilis: A Record of Four Cases.** F. E. DE W. CAYLEY. *Brit. J. Tuberc.*, July, 1956, 50: 262–264.

Four cases of syphilis occurring in the practice of a chest hospital are described; 3 patients had coincidental tuberculosis, one probably had pulmonary syphilis. The former responded well to antituberculous chemotherapy; the latter, to penicillin. Every patient admitted to the hospital diagnosed as tuberculous demands consideration whether the diagnosis is correct, and if any other condition is present. Although a serologic test for syphilis (Wassermann) need no longer be done routinely, it still remains a necessary procedure when any unusual clinical signs are discovered.

M. J. SMALL

**Cortisone and Chemotherapy in Pulmonary Tuberculosis.** J. B. COCHRAN, J. A. HISLOP, and C. CLAYSON. *Brit. J. Tuberc.*, July, 1956, 50: 269–276.

Nineteen patients with pulmonary tuberculosis were treated by cortisone combined with standard chemotherapy. Eleven of the 19 patients were considered to have shown accelerated improvement with cortisone.

Cortisone in doses up to 100 mg. daily for two months covered by antituberculous chemotherapy can be safely administered to patients with pulmonary tuberculosis whether the disease is acute or chronic, active or quiescent. This combined treatment causes symptomatic improvement with increase in appetite and gain in weight. On withdrawal of cortisone no obvious clinical deterioration occurs and the gain in weight is largely maintained.

For its general effect alone cortisone may have a place in the treatment of advanced and chronic disease; the roentgenographic effects were disappointing. In post-primary tuberculosis combined treatment has achieved its best results in acute disease. Cortisone had its maximal effect on the softer or fluffier opacities. There is evidence that cortisone may be of value in relieving the bronchial stenosis of primary disease. The indolent infiltrate or tuberculomatous lesion is unaffected, but further study of this group is required.

M. J. SMALL

**Erythromycin as Prophylaxis in Pulmonary Resection.** M. LOPEZ-BELIO, Y. TAKIMURA, R. T. FOX, and W. M. LEES. *J. Thoracic Surg.*, August, 1956, 32: 268–276.

Because empyema constitutes one of the more serious complications after pulmonary resection, there is a continuing necessity to seek a more effective prophylactic agent. In recent years antimicrobials have become decreasingly effective in preventing this complication due to increasing bacterial resistance to the drugs, especially evident in the case of penicillin-resistant staphylococci.

Erythromycin has been helpful because of its high activity against the microorganisms most often implicated in empyema, and because of its lack of toxicity and the demonstrated accumulation when given in multiple intrapleural doses. Thirty patients undergoing lung resection were studied. Erythromycin was found to be an effective prophylactic agent against pyogenic empyema in patients undergoing pulmonary resection except in cases in which empyema was secondary to the development of a bronchopleural fistula. Even here it appeared of value in controlling the infection, but it should be noted that its effectiveness was due to the higher drug concentration obtained by intravenous infusion and not by oral administration.

The effectiveness of the drug is dependent on the type of resection; particularly, the presence or absence of intrapleural catheters was the major factor. In the pneumonectomy group, effective concentration was found forty-eight hours after a 250 mg. intrapleural dose, and seventy-two hours after a dose of 400 mg. intrapleurally. The partial resection patients, however, had a more limited period of effective antimicrobial coverage because approximately 50 per cent of the drug was lost through the intrapleural cavity during the first three hours. Intrapleural dose in the partial resection patient should be augmented, generally in twelve

hours, by oral or intravenous administration; the latter is indicated especially when likelihood of infection is present. Particularly with penicillin, the diffusion from the blood stream into the pleural space is inadequate. However, erythromycin has been found to have considerably greater diffusibility. Pneumonectomy patients with a complicating fistula invariably develop empyema whereas in partial resection patients development of a fistula does not necessarily result in empyema.

R. E. MacQuigg

**The Persistent Pleural Space Following Partial Pulmonary Resection.** E. E. Wareham, H. Barber, J. S. McGoey, and L. Miscall. *J. Thoracic Surg.*, May, 1956, 31: 593–600.

In the postoperative roentgenograms of 136 consecutive patients undergoing partial pulmonary resection, there were 41 in whom a persistent pleural air space was found twenty-one or more days after operation. Soon after operation 14 of these patients had respiratory and constitutional symptoms indicative of bronchopleural fistula; 10 of the 14 had drug resistance to tubercle bacilli. In the latter group the prognosis was poor in spite of multiple operations; only 2 patients are clinically well. The remaining 4, whose infective organisms were preoperatively controlled by chemotherapy, are clinically well after further surgery. There were 27 patients with asymptomatic pleural air spaces who have had a satisfactory recovery with or without supplementary surgery.

It is concluded that postoperative pleural air space may safely be treated conservatively (*1*) if the patient is carefully observed, (*2*) if there is an absence of respiratory and constitutional symptoms, and (*3*) if there is a progressive shrinkage of the space on serial roentgenograms. In tuberculous patients, the sputum must be negative for tubercle bacilli. The patient should be on effective antimicrobial drug therapy for control of the parenchymal disease. If these criteria cannot be met, early surgical intervention for space obliteration is recommended.

R. E. MacQuigg

**Tracheostomy and Management of the Unconscious Patient.** J. Andrew. *Brit. M. J.*, August 11, 1956, No. 4988: 328–333.

The importance of maintaining a clear airway in comatose patients is again stressed. When consciousness is suddenly lost this may be achieved by placing the patient in a horizontal position and inserting a Magill airway into the mouth. If this is inadequate the trachea may be intubated through the mouth or nose. If coma is prolonged there is usually a coincidental depression of respiration and of the coughing and swallowing mechanisms. Secretions may be aspirated and retained in the smaller bronchi. The blood oxygen tension falls and carbon dioxide tension rises. Secondary circulatory changes occur, and these may lead to cerebral venous congestion and edema, and to pulmonary edema. Tracheostomy is of value in these cases, as it halves the dead-space air and allows for ease in the mechanical suction of the trachea and bronchi. A cuffed tube is advantageous in preventing the aspiration of secretion from the pharynx. The raising of the head and shoulders allows a fuller respiratory excursion by reducing the weight of the abdominal contents on the diaphragm. Venous return to the heart is thereby improved; the danger of cerebral venous congestion is reduced.

The source of the fluid accumulations in the lungs is discussed. When consciousness is suddenly lost from acute intracranial lesions it is believed that the fluid is secreted by the tracheobronchial mucous glands. The possible mechanisms for this secretion are discussed. When coma is prolonged the fluid is thought to be due to the same secretions, but additional factors are the development of a purulent bronchopulmonary infection and, terminally, pulmonary edema.

It is emphasized that in cases of coma tracheostomy should be an elective procedure, and its performance should not be delayed until the patient has become cyanosed or has begun to develop peripheral circulatory failure. Selected case histories are described from a series of 16 patients in whom this operation was performed (Author's summary).

E. A. Riley

**Decortication in Primary Tuberculous Pleuritis and Empyema with a Study of Functional Recovery.** G. I. Thomas and F. J. Jarvis. *J. Thoracic Surg.*, August, 1956, 32: 178–189.

Removal of a thick inflammatory tuberculous peel from the lung has been reported by many,

and technically it is more difficult than decortication following traumatic hemothorax. Even if there is frank empyema, most of the wounds heal without infection and few redevelop an empyema.

This report covers 16 cases of organized tuberculous pleuritis following effusion treated by visceroparietal decortication, no other surgical procedure being carried out.

Wright has shown by bronchospirometry that, following re-expansion of lung and restoration of normal or near normal ventilation, impairment may remain in pulmonary circulatory function. Diseased lung, initially compressed therapeutically and later released, is not likely to recover any large measure of function. This is confirmed by Patton, Watson, and Gaensler.

Decortication of tuberculous peel differs from that following clotted hemothorax which need not be totally excised. The parietal peel seems largely to resorb within a few weeks once the hemothorax is obliterated. Tuberculous peel is much more densely organized and frequently contains large areas of conglomerate caseation, more particularly as the diaphragm is approached. The ideal, not often attained, is a complete excision of the pleural sac intact. In any case, it is imperative in achieving a good functional result that the parietal and phrenic pleural peel as well as the visceral peel be excised. This is in agreement with Gale, who believes it essential to excise the parietal encasement.

The vascularity of the peel varies with its age and the activity of the inflammation. Blood loss is expected to be great and should be measured and replaced, volume for volume. Re-expansion postoperatively may be slow. Air leakage from raw lung parenchyma is inevitable. To aid expansion, tubes are placed at base and apex with negative pressure from a Chamberlain pump.

Six preoperative bronchospirometric determinations are included with accent on comparative oxygen uptake studies. It was believed that if the effusion which is no longer aspirable is attacked early, gratifying return of function to normal or near normal levels may result. Extensive parenchymal involvement is, of course, a limiting factor.

R. E. MacQuigg

**Postoperative Cough and the Prophylactic Use of Bronchodilators.** A. G. F. Romagnoli and H. M. Bird. *Canad. M. A. J.*, August 1, 1956, 75: 210–212.

The incidence of postoperative cough following surgical procedures varies between 21.7 per cent for upper laparotomies and 0.2 per cent for ophthalmic surgery. Following 200 appendectomies and herniotomies, the incidence of postoperative cough was 9.2 per cent. With the routine use of postoperative theophyllineethylenediamine the incidence of postoperative cough fell to 6 per cent and with the use of N-isopropyl-novadrenaline fell to 3 per cent. There were no major respiratory complications.

E. A. Riley

**Inhaled Foreign Bodies.** C. L. N. Robinson and W. W. Mushin. *Brit. M. J.*, August 11, 1956, No. 4988: 324–328.

Experience has been gained with 25 cases of inhaled foreign body, mostly in children. The early history of an inhaled foreign body is often missed; the later results may simulate almost any chest disease. The diagnosis is made from the history and the presence, on clinical examination, of atelectasis or obstructive emphysema, and from chest roentgenography. The importance of early removal of the foreign body by a team consisting of an experienced bronchoscopist and an experienced anesthetist is stressed. The essential part of the anesthetic is surface analgesia of the trachea and bronchi. If removal by bronchoscopy fails, thoracotomy and bronchotomy are justified, with the sacrifice of any destroyed lung. The majority of inhalation accidents may be prevented: nuts should not be given to young children who have no molars, small objects must be kept out of an infant's reach, and care should be taken with loose teeth in an anesthetized patient (Authors' summary).

E. A. Riley

**Multiple Rib Fracture with Instability of Chest Wall.** R. R. Crutcher and T. M. Nolen. *J. Thoracic Surg.*, July, 1956, 32: 15–21.

In the general management of the unstable chest wall, particular importance is placed on early relief of pneumothorax by insertion of a large intercostal catheter, temporary stabili

zation by external traction, removal of blood from the pleural cavity when present in significant quantity, blood replacement to normal level, nasotracheal suction every hour (which must stimulate cough to be effective), tracheotomy if nasotracheal suction is not effective, and intercostal nerve block anesthesia if possible. Twenty-four hours is usually sufficient for evaluation and stabilization of the patient.

One should then consider permanent stabilization of the chest wall if there is significant paradoxical motion, or if there is a considerable deformity due to the fractured ribs. A long period of immobilization in bed with traction technique has many associated complications and the economic factor of prolonged hospitalization demands quicker rehabilitation.

Stabilization can best be accomplished by use of the intramedullary Rush nail. Wiring, as advocated by Coleman and Coleman, has been used where intramedullary fixation is not practical. Both general and local anesthesia have been used with equally good results. Although at least a small opening in the pleura is usually made during the procedure, the patient, with an intercostal tube in the pleural cavity attached to a water-seal bottle, can keep the lung expanded by coughing and blowing against the cheeks.

A total of 14 patients was treated by some form of internal fixation. All had traumatic fractures except one, who had an esophageal resection in which several ribs were divided for more adequate exposure. Incision must be adequate to allow the drill and nail to be inserted tangentially to the rib. The smallest diameter Rush nail may be too large for very small subjects. In fractures near the posterior angle of the rib, it is necessary to bend the nail to approximate the contour of the rib; however, the nail should fit tightly and should maintain the normal contour of the rib.

R. E. MacQuigg

**Aluminium Powder Inhalations in the Treatment of Silicosis of Pottery Workers and Pneumoconiosis of Coal-Miners.** M. C. S. Kennedy. *Brit. J. Indust. Med.*, April, 1956, 13: 85–101.

A controlled trial of aluminum inhalations in the treatment of pottery worker's and coal worker's pneumoconiosis was carried out over four years. One hundred and twenty patients were selected to meet certain criteria and were then separated by pairing into two equal groups comparable as to age, sex, industrial history, and manifestations of the disease. Individual patients were then allocated to two forms of treatment.

*Group A* received pure metallic aluminum dust and *Group B*, pure carbon (powder) with the addition of 1 p.p.m. pure metallic aluminum powder. Both groups were given fifteen-minute inhalations three times a week for as long as three and one-half years.

There was no regression of the roentgenographic picture, nor was there objective evidence of improvement in the functional capacity, although there was symptomatic improvement in both groups, mainly psychologic in origin.

There was no evidence that the aluminum inhalations favored the development of pulmonary tuberculosis in patients with coal worker's or pottery worker's pneumoconiosis.

H. Abeles

**Pneumoconiosis Due to Aluminium Dust. Follow-Up Observations and Report of New Cases.** G. Barth, W. Frik, and H. Schneidemandel. *Deutsche med. Wchnschr.*, July 13, 1956, 81: 1115–1119.

Ten of 18 patients who developed aluminum pneumoconiosis before or during the last war died. In the remaining 8 patients the condition became stationary. Recently, 3 new cases of aluminum pneumoconiosis were diagnosed.

The chief symptoms were dyspnea, productive cough, lack of appetite, and sticking pain in the chest. The chest roentgenograms showed dense infiltrations in both upper lobes with localized emphysema and marked elevation of the hilar shadows. Sputum examinations were negative for tubercle bacilli except in one case. On histologic examination, there was marked fibrosis and hyalinization.

Pathologic changes are due to a chemical reaction between the aluminum dust and the lung tissue. Aluminum dust cannot be demonstrated in the lung.

H. Abeles

**Fat Embolism in Korean Battle Casualties.** R. E. Scully. *Am. J. Path.*, May–June, 1956, 32: 379–403.

The significance of fat embolism following trauma is controversial. Clinically, two forms are described: pulmonary and cerebral. Pul-

monary embolism is suspected when dyspnea appears immediately after injury or after an interval of hours to days. This may be associated with other signs of pulmonary distress and may even result in death. The authors investigated 110 deaths occurring in military hospitals up to four weeks after battle trauma. Fat droplets in pulmonary tissues were found in 90 per cent of the patients. In 19 per cent the degree of embolization was more than slight. Only 4 per cent showed more than slight systemic embolization and only 1 per cent showed fatal cerebral fat embolism. From neither clinical nor pathologic viewpoints was there evidence that fat in the lungs caused pulmonary dysfunction or death.

S. J. HADLEY

**Chronic Localized Pulmonary Brucellosis.** L. A. WEED, P. T. SLOSS, and O. T. CLAGETT. *J.A.M.A.*, July 14, 1956, 161: 1044–1047.

The chest roentgenograms of 3 patients showed multiple, large nodular lesions in one case and single, well circumscribed nodules in the other 2 cases. All lesions were resected. Histologic examination revealed caseous granulomas which contained *Brucella suis*. The postoperative course was uneventful.

H. ABELES

**Echinococcosis in North American Indians and Eskimos.** H. MELTZER, L. KOVACS, T. ORFORD, and M. MATAS. *Canad. M. A. J.*, July 15, 1956, 75: 121–128.

Among 180 cases of hydatid disease seen in Canadian Indians and Eskimos, lung cysts were present in 109, mainly in children and young adults. Liver cysts were found in 71 patients. The pulmonary cysts were found almost equally in the two lungs, with a marked tendency to posterior localization. Symptoms were variable and included cough, hemoptysis, and vascular congestion. Pain is exceptional without pleural involvement. Among the 109 lung cysts, 54 ruptured spontaneously following gradual enlargement over a period of years. The uncomplicated cyst cannot be roentgenographically differentiated from tumor. Indications for surgery were rapid growth of the cyst, secondary infection of the ruptured cyst cavity, empyema, and uncertain diagnosis. Principles underlying surgical treatment are removal of the parasite, avoidance of contamination, and elimination of the residual space. Twenty-three patients were operated on in this series. Five had lobectomy; 4, wedge resection; and one, segmental resection. Of the last 13 patients operated on, 12 had simple cyst removal and the remaining one required a pleural decortication for chronic empyema following rupture of the cyst into the pleural cavity.

E. A. RILEY

**Pulmonary Manifestations in Schistosomiasis Following Tartar Emetic Therapy.** C. DAO, F. Y. FU, and W. L. CH'I. *Chinese M. J.*, May–June, 1956, 74: 268–274.

Four cases of schistosomiasis japonica that showed characteristic pulmonary changes following treatment with potassium antimony tartrate are reported. Especially noted are (*1*) fever and irritating cough occurring usually toward the end of the tartar emetic therapy; (*2*) the apparent well-being of the patients during this period; (*3*) typical roentgenographic findings in the lung of miliary infiltrations and patchy consolidations; and (*4*) a short and self-limited course averaging from five to nine days, with delayed resolution of the pulmonary lesions. If the roentgenographic miliary lesions are due to cellular infiltrations around the ova, then their appearance after tartar emetic therapy would indicate either fresh dissemination of ova to the lungs or reactivation of pre-existing lesions. A previous assumption of allergic reactions around pre-existing circumoval lesions appears less likely, based on recent studies. It seems likely that some of the cases of "acute bronchitis" or "pneumonia" complicating tartar emetic therapy mentioned in text books on pharmacology and parasitology are due to pulmonary manifestations of a parasitic nature. Differential diagnosis must also include miliary tuberculosis, Löffler's syndrome and passive congestion, which can be ruled out on clinical grounds.

L. HYDE

**Pulmonary Aspergilloma** (in German). W. HÖFFKEN. *Fortschr. Röntgenstr.*, April, 1956, 84: 397–407.

Aspergillosis affects the lung either in a diffuse, bronchopulmonary form, or in a localized form, the aspergilloma. The latter consists of an accumulation of fungi in a preformed space. Tomographic examination of the aspergilloma shows a large central density surrounded by a circular air space. On bronchographic examina-

tion it can be shown that the air space communicates with the draining bronchus. Clinically, recurrent hemoptysis is common. Since conservative treatment is not successful, surgical removal of the affected pulmonary segment is indicated. A case is reported in which the aspergilloma was located in a congenital cyst as demonstrated by histologic studies of the resected lobe.

H. Abeles

**Diagnosis of Cancer of Lung and Stomach.** A. McKenzie. *Brit. M. J.*, July 28, 1956, No. 4986: 204–207.

Because of the marked increase in deaths due to carcinoma of the lung in recent years an attempt was made to determine if cancer of the lung is being over-reported. Among 634 cases reported, in all but 18 additional information supported the clinical diagnosis of lung cancer. In 8 of the 18 cases the lung was found not to be carcinomatous and in the remaining 10 cases the tumor was found to be metastatic from primary sites elsewhere. In the 8 cases wrongly diagnosed as lung cancer, subsequent tissue examination disproved the clinical diagnosis. Eighty-five per cent of the cases were in males. Methods of confirmation included postmortem examination in 87 patients (24 per cent), thoracotomy in 72 (20 per cent), cytologic studies in 24 (7 per cent), and bronchoscopy in 173 (49 per cent). Among 109 cases in which classification was possible, adenocarcinoma occurred in 7 per cent, undifferentiated carcinoma in 58 per cent, and squamous carcinoma in 35 per cent.

E. A. Riley

**Carcinoma of the Lung.** G. Frkovich, R. Robertson, and R. Gourlay. *Canad. M.A.J.*, August 1, 1956, 75: 207–210.

Among 252 cases of carcinoma of the lung, 103 (40.9 per cent) were clinically inoperable, 100 (39.7 per cent) were resectable, and in 49 (19.4 per cent) the lesion was found unresectable at operation. In the 100 patients who had resections, there were 52 squamous cell carcinomas, 31 anaplastic, 16 adenocarcinomas, and one alveolar cell carcinoma. The average survival period of the clinically inoperable patients was 3.3 months; of the operable but unresectable patients the average survival was 7.1 months. The surgical mortality for the 100 patients who had resections was 13 per cent. The incidence was considerably high in patients operated upon for palliation (17 per cent) rather than for cure (8.5 per cent). Among 49 patients operated upon more than five years ago, there are 8 (16.3 per cent) survivors. The majority of deaths due to recurrence occurred within the first postoperative year and no recurrence occurred two years after resection. Among 66 patients operated upon more than three years ago, there are 14 (21.2 per cent) survivors. The anaplastic type of carcinoma showed a probable cure rate after three years of 25 per cent, adenocarcinoma, of 50 per cent, and squamous cell carcinoma, of 52.2 per cent.

E. A. Riley

**Fifty-One Cases of Lung Cancer with Five-Year Survival.** R. H. Overholt and J. A. Bougas. *J.A.M.A.*, July 7, 1956, 161: 961–963.

In a search for common denominators, the extent, character, and management of 51 patients who were living five years after operation for histologically verified lung cancer were studied. The 51 patients came from a group of 845 cases of pulmonary cancer of which 35 per cent (234 cases) were treated by resection. Resection mortality was 15 per cent. Age and sex seem to have little bearing on curability. In 7 of the 51 cases the diagnosis was made following a survey examination, while in the remaining 44 cases symptoms brought the patient to the physician. The following factors were universally present in all of the five-year survival cases: the disease was apprehended on the basis of a roentgenographic examination, the diagnosis was established by exploratory thoracotomy, and cure was effected by surgical excision.

H. Abeles

**Bronchogenic Carcinoma with *in Situ* Carcinoma in the Opposite Lung.** R. F. Ryan and J. R. McDonald. *Proc. Staff Meet., Mayo Clin.*, August 22, 1956, 31: 478–485.

Thirty-nine necropsy specimens were studied from males from whom one lung had previously been removed for squamous cell carcinoma. On gross examination in all cases the bronchial epithelium of the remaining lung appeared normal. In 5 cases, however, definite areas of *in situ* squamous cell carcinoma were found.

These lesions were thought to be new foci of malignant degeneration and not metastatic disease. Although the significance of these lesions is not definitely known, it is assumed that some patients who obtain poor results from operation may be suffering from the effects of new lesions rather than metastases.

E. A. RILEY

**Recurrent Carcinoma in the Bronchial Stump.** H. C. HABEIN, JR., J. R. MCDONALD, and O. T. CLAGETT. *J. Thoracic Surg.*, June, 1956, 31: 703–717.

There are no available reports concerning the recurrence of carcinoma of the bronchial stump (which cannot be determined from purely surgical material). This report covers 18 patients with such recurrence at the Mayo Clinic from a total of 631 undergoing resection for bronchogenic carcinoma prior to September, 1952.

Findings at preoperative bronchoscopy are important in view of the recent work of Rabin and his associates with biopsy near the carina. These workers found the procedure extremely useful since it produced positive findings in close to 20 per cent of patients who were considered otherwise operable. Apparently, biopsy may be positive even in the presence of grossly normal mucosa.

All of the tumors which in the Mayo Clinic series recurred in the bronchial stump were squamous cell carcinomas of a high histologic Broders grade.

The diagnosis of bronchial stump recurrence was established by bronchoscopy in 16 cases and by cytologic examination of sputum in the remaining 2 cases in this series.

R. E. MACQUIGG

**Spontaneous Mediastinal Emphysema Due to Perforated Tumor** (in German). W. FRIK and R. HESSE. *Fortschr. Röntgenstr.*, June, 1956, 84: 754–756.

A case is reported in which a spontaneous mediastinal emphysema was caused by a bronchogenic carcinoma of the left hilar region which had broken into the main bronchus and the esophagus. The patient died of mediastinitis.

H. ABELES

**The Influence of Histologic Type on Survival Following Radiotherapy of Bronchogenic Carcinoma.** E. R. KUTZ. *J. Thoracic Surg.*, August, 1956, 32: 165–170.

In the voluminous literature on radiotherapy of bronchogenic carcinoma, there are only a few conclusions with general agreement. Almost all agree that radiotherapy never cures carcinoma of the lung. In fact, there are very few patients who survive more than five years following treatment. There is general, but not unanimous, agreement that radiotherapy seems to prolong life even though this is often for several months only. Some authors consider survival time as that between the onset of symptoms and death of the patient; others, as the period of time between diagnosis and death; and a third and fourth group express it as the time between onset of treatment or termination of treatment and death, respectively. All of these definitions of survival time create confusion.

The article analyzes 74 patients with medically or histologically diagnosed intrathoracic mass lesions referred to the Allegheny General Hospital department of radiotherapy between 1952 and 1955. Of these cases, 50 were taken for this study and were treated on a 400 kilovolt generator with half-value-layer of 6.5 ml. of copper. With a beam of this quality, 5,000 to 6,000 roentgens can be delivered to the tumor through two or three ports.

In 20 cases of undifferentiated carcinoma, 18 squamous cell, 3 adenocarcinoma, and 9 which were of unknown cell type, the average survival time was over twice as long for the squamous cell group as it was for the anaplastic group. Although there was no control group, the literature has many reports of control groups, and few patients with bronchogenic carcinoma survive one year after diagnosis without any form of therapy. The fact that in 53 per cent one-year survival rate was obtained after treatment indicates that squamous cell lesions are benefited. The survival time with undifferentiated lesions was very poor and it is doubtful that radiation therapy increases the survival time, perhaps because these lesions metastasize early as shown by metastases outside the thorax in 45 per cent of the cases treated, and because they are by nature extremely invasive and, although radiosensitive, they are also rapidly recuperable.

R. E. MACQUIGG

**A New Technique for Bronchography in Children.** J. B. Brooks and J. W. Lewis. *Arch. Dis. Childhood*, February, 1956, 31: 35–37.

Preliminary measures are taken to have the bronchial tree as free of secretion as possible, and to ensure the child's cooperation. The child is anesthetized with thiopentone and nitrous oxide-oxygen for the introduction of a Magill nasal tube and the application of local anesthesia (xylocaine) to the respiratory tract. Then the child is allowed to wake up for the introduction of the contrast medium (Dionosil,® 60 per cent, w/v.) and for the roentgenographic exposures. The best bronchograms are obtained when the child is awake and cooperative during this part of the procedure. However, if the child does not cooperate, he can be kept asleep by an additional dose of thiopentone. The contrast medium is introduced through a polyethylene tube which is pushed through the Magill tube. The child is postured to outline each bronchus in turn. When adequate bronchograms have been obtained, the contrast medium is aspirated through a catheter via the Magill tube. These are then removed. Postural drainage is continued until the bronchi are clear.

The method was used in 40 children ranging in age from three to seventeen years. There were no ill effects. The absence of anoxia and cyanosis may have been in part due to the avoidance of bilateral simultaneous bronchography. Good bronchograms were obtained in 95 per cent.

G. Bondi

## NONPULMONARY

**Cryptococcosis: Report of a Case.** W. F. Cheng. *Chinese M. J.*, July–August, 1956, 74: 374–386.

The eighth case of cryptococcosis from China is reported and the previous 7 cases are reviewed. A 41-year-old male had pulmonary infiltration on chest roentgenogram with fever and headache. Meningitis developed and he was hospitalized and treated with streptomycin and PAS for presumptive tuberculosis. Repeated sputum examinations at the onset of his disease were negative for tubercle bacilli and positive for *Cryptococcus neoformans*. The spinal fluid was not cultured. Subsequently the left lung became consolidated and tubercle bacilli were repeatedly isolated from the sputum. The patient died after fourteen months of illness. A lung biopsy revealed "mycotic infection." Chemotherapy failed to alter the clinical course in the 8 cases reviewed and all died.

L. Hyde

**Host Influence on Upper Respiratory Flora.** M. B. Dunlap and H. S. Harvey. *New England J. Med.*, October 4, 1956, 255: 640–646.

In the present study repeated monthly throat and nose cultures were taken on the same group of people for a period covering twenty-one months. The work was done on thirty-eight families from six towns in the Nashoba Health District, a rural area in central Massachusetts. Preliminary observations showed that the common respiratory pathogens present were the hemolytic streptococcus, *Haemophilus influenzae*, and the pneumococcus. Also included in the study was *H. haemolyticus*, which, it is assumed, has no pathogenic significance. All the subjects were essentially healthy throughout the period of observation.

*Haemophilus influenzae* and *H. haemolyticus* were found in nearly all persons exposed to these organisms within their family group, beta-hemolytic streptococci in about half thus exposed, and pneumococci in about two-thirds. An age curve for hemolytic streptococci, with a peak at five to six years, was constructed from the data. The pneumococcus showed little significant variation by age in the throat, but it was most common for the baby of the family to carry it in his nose. In fact, a veritable age precipice was found regarding the pneumococcus in noses.

Some of the adults seem to carry the organism most of the time and yet are never sick. Host factors that need further elucidation are suggested. These data indicate that the most marked host influence occurred with the organism known to be most pathogenic—the hemolytic streptococcus—and that practically no host influence occurred with an organism that is not considered to be pathogenic—*H. haemolyticus*; an intermediate position was occupied by *H. influenzae* and the pneumococcus, organisms whose pathogenicity, when they are resident in the upper respiratory tract, is variable.

M. J. Small

**Primary Carcinoma of the Fallopian Tube.** J. P. Long, H. P. James, G. T. Mills, C. E. Jabbour, and R. Walker. *U. S. Armed Forces M. J.*, September, 1956, 7: 1359–1367.

A case of primary carcinoma of the fallopian tube, one of the rarest of all malignancies and frequently associated with tubal tuberculosis, is reported. A massive right pleural effusion was present and autopsy revealed extensive metastases to the lungs and pleura.

E. A. Riley

**Fibrocystic Disease of the Pancreas in the Newborn.** A. E. Claireaux. *Arch. Dis. Childhood*, February, 1956, 31: 22–27.

Autopsy of an infant who died during delivery revealed fibrocystic disease of the pancreas. The cause of death was anoxia, entirely unrelated to the fibrocystic disease. Typical lesions were present in the pancreas and liver. The lungs were slightly expanded as a result of excessive aspiration of liquor amnii. Many alveoli and alveolar ducts contained cornified cells. The bronchi in the lung roots showed an abnormality of the mucous glands. These glands were distended with inspissated secretion. The bronchial epithelium had a normal appearance. Other mild changes were found in the submandibular salivary gland and in some of the mucous glands of the alimentary tract.

G. Bondi

**Fibrocystic Disease of the Pancreas Presenting with Acute Salt Depletion.** J. Rendle-Short. *Arch. Dis. Childhood*, February, 1956, 31: 28–30.

A case of fibrocystic disease presenting with dehydration and salt depletion is recorded. The water and salt loss was due to excessive sweating occasioned not by heat but by an illness, probably a respiratory infection (Author's summary).

G. Bondi

**Acute Pancreatitis Following Administration of Isonicotinic Acid Hydrazide: Report of a Case.** I. Dickson. *Brit. J. Tuberc.*, July, 1956, 50: 277–278.

Since the advent of therapy with isoniazid for tuberculosis, there have been a number of cases in which a marked influence on carbohydrate metabolism has been noted. There appears to be some evidence that the drug has a direct inhibiting action on the islets of Langerhans, but the case reported suggests the possibility in some cases of a direct effect on all the pancreatic tissue.

A tuberculous diabetic is described whose diabetic state was markedly and permanently aggravated by administration of isoniazid. Recommencement of isoniazid therapy after an interval of four months resulted in an acute pancreatitis and death of the patient.

Apart from the usual difficulty in stabilizing diabetics who are receiving isoniazid, any symptoms suggesting a more extensive involvement of the pancreas, such as nausea and vomiting, diarrhea, or severe abdominal pain, should be regarded with utmost suspicion, and should be a strong indication for stopping the isoniazid therapy.

M. J. Small

**On the Effect of Vitamin P on Blood and Urine Concentrations of PAS After Intravenous Infusion** (in German). R. Haizmann. *Wien. klin. Wchnschr.*, August 3, 1956, 68: 622–626.

In 34 patients with various forms of chronic pulmonary tuberculosis the effect of rutin on blood concentration and urine excretion of PAS was examined. Twenty-four grams of sodium PAS were administered intravenously. When 100 mg. of rutin were given simultaneously intravenously and intramuscularly at the onset of the infusion, the blood concentration of PAS was increased but not prolonged. The quantity of PAS excreted in the urine within eight and one-half hours was decreased under the influence of rutin. There was a significant difference between the values found without and with rutin administration.

G. C. Leiner

**Dermatological Complications of B.C.G. Vaccination.** B. B. Jorgensen and O. Horwitz. *Acta tuberc. Scandinav.*, 1956, 32: 179–194.

An analysis is presented of the skin complications seen in 100 patients following intradermal BCG vaccination. There were 166 such complications in these patients, of which 150 were specific and 16 nonspecific. The specific complications, which generally ran a mild course, included subcutaneous abscesses, scrofuloderma, lymphangitis, local and universal tuberculide, lupus vulgaris, lupoid affection, Koch's phenomenon, and regional and univer-

sal adenitis. Local eczema and keloid constituted the major nonspecific complications.

Complications were observed in all age groups usually vaccinated. However, lupus, lupoid affection, and Koch's phenomenon were noted only in adults, whereas universal tuberculides were observed only in children. Complications were more frequent and severer among those revaccinated than among those vaccinated only once. The series of patients reviewed permitted no conclusions regarding the frequency of complications among persons vaccinated with BCG.

M. Weiss

## LABORATORY STUDIES

**Induction of Virulence in an Avirulent Strain of *Mycobacterium Tuberculosis* by Certain Non-Ionic Surface-Active Agents.** P. D'A. Hart and R. J. W. Reese. *Brit. J. Exper. Path.*, August, 1956, 37: 372–384.

A change in colony formation, reduced dehydrogenase activity, and an acquisition of virulence was found when the avirulent strain of *Mycobacterium tuberculosis* H4Ra was repeatedly subcultured in a liquid medium containing either triton A20 or a chemically similar nonionic surface-active polyoxyethylene ether D4. Virulence was determined by intravenous injection of mice.

H. J. Henderson

**The Development *in Vitro* of an Avirulent, Immunogenic Variant of *Mycobacterium Tuberculosis* var. *Hominis*.** A. S. Youmans and G. P. Youmans. *Proc. Soc. Exper. Biol. & Med.*, July, 1956, 92: 566–569.

A variant of the H37Rv strain of *Mycobacterium tuberculosis* var. *hominis* which appears to be avirulent for mice and guinea pigs was developed *in vitro* by continued subculture over a three-year period on a nitrogen-free synthetic medium. This new strain, designated H37RaN, resembled the parent H37Rv strain both macroscopically and microscopically, but differed metabolically from the parent strain in its reduced ability to utilize for growth carbon compounds related to the tricarboxylic cycle. This strain immunized mice as well as the frequently used immunogenic strains, H37Ra and BCG.

E. Soto-Figueroa

**A Projection Lamp Apparatus for Fluorescence Microscopy of Tubercle Bacilli.** W. Kwantes. *Monthly Bull. Minist. Health (Lond.)*, August, 1956, 201–204.

A projection lamp apparatus specially designed for fluorescence microscopy is described. Its advantages over a mercury vapor lamp are mentioned. It has been used satisfactorily in a routine laboratory and has resulted in a saving of one-third of the time necessary for searching for tubercle bacilli when compared with the routine Ziehl-Neelsen method (Author's summary).

E. D. Kilbourne

**Methods of Cultivation of the Hansen Bacillus.** S. A. Freire. *Internat. J. Leprosy*, January-March, 1956, 24: 57–63.

The varied and conflicting claims regarding cultivation of the Hansen bacillus are reviewed. The author reports on techniques which have effected the cultivation of the authentic *M. leprae*. The process employed for this demonstration of authenticity will be published in a separate paper which will describe the use of a medium in which subcultures can be obtained with the formation of globi.

By the method of slide culture in a nutrient medium consisting of Kirschner's solution with a 0.1 per cent agar and 20 per cent lepromatous plasma or serum, a culture of *M. leprae* can be obtained by incubation at 37.5°C. Under these conditions, by comparison of the control smears with those incubated in the culture medium, the presence of newly-formed globi characteristic of Hansen's bacillus can be detected.

E. D. Kilbourne

**Freeze-Dried B.C.G. Vaccine, Methods Adopted in Preparation of a Standard Product.** J. Ungar, P. Farmer, and P. W. Muggleton. *Brit. M. J.*, September 8, 1956, No. 4992: 568–571.

A method is described for the production of a freeze-dried BCG vaccine by using dextran with glucose as a protein-free drying medium. The BCG organisms for vaccine production

can conveniently be grown in deep culture in Sauton's medium with 0.025 per cent triton WR1339—a nonionic polyoxyethylene ether—without affecting their biologic properties.

The bacteria, uniformly dispersed, can be easily harvested in the centrifuge and the deposit resuspended in dextran-glucose solution. A method is described for enumerating the viable cells with consistent results; the viable-cell content of different batches of vaccine can be accurately standardized. A study of the keeping properties of the dried vaccine has shown that it has a life of at least twelve months when stored at less than 20°C. The relationship between the viable-cell counts of various batches and the tuberculin conversion of guinea pigs is shown. There is also a direct correlation between the viable-cell count and the size of local lesions in guinea pigs after intradermal injection (Authors' summary).

E. A. RILEY

**Effect of Preservation on the Viability and Allergenic Potency of Dried BCG Vaccine.** Y. OBAYASHI, J. KAWASAKI, T. YOSHIOKA, T. SHIMAO, and T. NOGUCHI. *Bull. WHO*, 1956, 14: 529–542.

Although many studies have been made on the lyophilization of BCG vaccine, few reports on its stability have appeared. The authors demonstrated that the present dried BCG vaccine possesses a high degree of preservability as long as it is kept at about 5°C. Although the number of living bacilli in the vaccine does gradually decrease, if they are initially present in relatively large quantities the allergy-producing potency of the vaccine is maintained at a satisfactory level for at least two years.

H. ABELES

**Effect of Adjuvant on Preservability of Dried BCG Vaccine at 37°C.** C. CHO AND Y. OBAYASHI. *Bull. WHO*, 1956, 14: 657–669.

Experiments were carried out to determine the effect of various adjuvants on the preservability of dried BCG vaccine at 37°C. The highest BCG survival rate was obtained with 1 per cent sodium glutamate vaccine. It seems possible to produce a dried BCG vaccine the viability of which will not be adversely affected by storage for several months at room temperature, even in hot climates.

H. ABELES

**Complement Fixation by Tuberculopolysaccharide.** F. B. SEIBERT and E. SOTO-FIGUEROA. *Proc. Soc. Exper. Biol. & Med.*, August-September, 1956, 92: 811–814.

High complement-fixation titers with PPD-S (purified protein derivative) were obtained with BCG antisera which showed high precipitating antibodies to PPD-S and to tuberculopolysaccharide. Polysaccharide fixed no complement even in these sera when incubation was carried out at 37°C. However, at 4°C. fixation did take place. When polysaccharide was mixed with PPD-S the complement-fixation titer was decreased from that obtained with the PPD-S alone, suggesting inhibition of fixation at 37°C. However, this decrease appeared to be due to fixation by polysaccharide in the first stage, followed by a probable release of the complement to the erythrocyte-amboceptor system in the second stage.

E. SOTO-FIGUEROA

**Enhancement of Resistance to Murine Leprosy by BCG plus Specific Antigen.** J. H. HANKS and J. M. M. FERNANDEZ. *Internat. J. Leprosy*, January–March, 1956, 24: 65–73.

The importance of specific immune response and a means of enhancing specific protection against leprotic infections have been investigated. Rats were challenged with *M. lepraemurium* after having received the following antigens: attenuated tubercle bacilli of the BCG and R1Rv strains, heat-killed suspensions of *M. lepraemurium*, and the attenuated tubercle bacilli accompanied by smaller amounts of *M. lepraemurium* antigen. The results indicate that specific antigen plays a distinctive role in protection and that superior protection is afforded by small amounts of specific antigen combined with tubercle bacilli as stimulators of immune response.

Significant protection was achieved by single administrations of antigen on a basis adopted to practical application. The liabilities which may attend large and repeated doses of mycobacterial antigens have been emphasized as peculiar to those persons most in need of protection. The theoretic basis of enhancing response to modest amounts of specific antigen has been indicated (Authors' summary).

E. D. KILBOURNE

## PUBLIC HEALTH AND EPIDEMIOLOGY

**Domiciliary Treatment of Pulmonary Tuberculosis.** J. W. Fraser. *Brit. J. Tuberc.*, July, 1956, 50: 256-261.

With suitable home conditions, it is possible to treat minimal and moderately advanced pulmonary tuberculosis without admission to a sanatorium. The patient with far advanced disease can also receive considerable benefit from home treatment. Four representative cases are described.

Elderly and "chronic" patients are not considered suitable for the hospital unless they have adverse home conditions.

The need for daily streptomycin and long-continued combined treatment is emphasized.

This is not to deny the use of the sanatorium bed, however. A patient will require admission to the hospital when home conditions are unsuitable or when he is so seriously ill that he requires skilled nursing. In addition, admission to the hospital will be essential for surgery. With the extension of home treatment the use of sanatoriums will undergo revision. It would be much more beneficial to the community at large if the money saved on hospital beds could be used to provide camera units at every chest clinic so that frequent roentgenographic examinations might be available for contact examination. Open sessions for general practitioners might also be provided. By using every means available to find cases early it might be possible to diagnose them at such a stage that they could be treated as ambulatory patients or by modified bed rest without admission to a sanatorium.

M. J. Small

**Tuberculous Infection in the Population of the Province of Ontario.** S. Grzybowski. *Canad. M.A.J.*, September 15, 1956, 75: 493-496.

Tuberculin-test surveys in the province of Ontario show that in large cities approximately 10 per cent of the population have been infected by the age of fifteen, 20 per cent by the age of twenty, approximately half by the age of thirty-five, and 75 per cent by the age of sixty. In the rural areas and smaller cities, these rates are substantially lower; only about 4 per cent are infected by the age of fifteen; data for older age groups are lacking. The average yearly increase varies between 0.7 per cent and 2.0 per cent. Although morbidity rates among the infected are the highest in young people, reaching 35.6 per 10,000 tuberculin-positive subjects between fifteen and nineteen years of age, the mortality is almost steady at a level of about 1 per 10,000 tuberculin-positive subjects between the ages of fifteen and fifty, but this begins to rise, reaching 2.8 in those more than sixty years of age. Analysis suggests that approximately 3 of 4 persons less than thirty-five would not need a chest film if screened first by tuberculin tests.

E. A. Riley